NTSB
Public Forum on
Positive Train Control

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PTC History

- Original vision – stand alone – intelligence in the office. Minimal wayside infrastructure (around 1980).
- Communications infrastructure was created as ATCS spec 200 900 MHz system.
- Band width of 156 KHz and 6 channel pairs of 13 KHz was insufficient to handle volumes of communications needed to do PTC.
- Several pilots were done in the industry:
  - BN – ARES
  - BN/UP – PTS project – Pacific NW
  - IDOT - UP
  - CBTM – on CSXT

PTC History

- Pilots were abandoned due to communications capacity and an unattainable functional Back Office System.
- PTC-RSAC was formed in the 1990s and came up with 236 Section H specifications.
- Pilots were started under Section H and BNSF certified a system. BNSF used a 44 MHz spectrum as well as 900 MHz.
- 2007 - NS and UP concluded that available communication spectrum was insufficient and PTC 220, LLC was created, which now owns 330 KHz of spectrum nationwide.

PTC History

- 2008 RSIA enacted by Congress, requiring PTC on certain passenger and TIH/PIH lines by 12/31/2015.
- 2008-2009 PTC RSAC was established and 236 Section I regulations were issued in 2010.
- Railroads joined in the development of common PTC project through ITC (Interoperable Train Control). Signatories are BNSF, CSX, NS and UP.

PTC History

- ITC developed specifications for interoperability, which was a new requirement.
- Railroads are jointly developing a Section I compliant PTC system with WABTEC as a vendor.
- CSXT, NS and UP joined BNSF as owners of MeteorComm, a radio company in Seattle, Washington to develop 220 MHz PTC radios and a system management for PTC radios.

Vision to Reality

- PTC is much more complicated than anyone ever envisioned.
- A vital central office system has been attempted and proven to be unattainable as a first step due to complexity.
- Railroads realized that they need to learn how to crawl before they can walk.
- All subsystems currently under design are mostly unproven.
- The current overlay system isn’t reaching the original vision, but is a necessary step to make PTC reliable.

Perspective

- The scope of US PTC roll-out is unprecedented in the World.
- Scope is 60,000 miles and 18,000 locomotives in about 5 years.
- At present, PTC reliability at startup is expected to be below acceptable standards. Many of the subsystems will be reliable, but total system reliability is expected to cause many unintended stops as shown in a study made by ARINC for the ITC group.
- FRA's regulations on en-route failures are expected to reduce railroad capacity, shifting traffic to less safe modes of transportation.
- Scope creep needs to stop. Add-ons, such as using PTC for grade crossing interaction will increase complexity and create additional delays in the implementation.
- FRA and Congress need to freeze the requirements for PTC. We can't implement a moving target efficiently and in a timely manner.

Perspective

- Interoperability requirement by the RSIA has made PTC at least twice as complex.
- Europeans have been working on transponder-based systems in ETCS level 1 and transponder and GSM-R communications systems in ETCS Level 2 for over 20 years.
- Only 1,700 miles of Level 1 & 2 systems have been deployed in various revenue pilot tests.
- ETCS level 3 system contemplates a vital back office function and none of these systems have been completed due to complexity and reliability concerns.
- A map of ETCS rollout is attached.

ETCS Lines in Commercial Operation